POLICY RESEARCH WORKING PAPER 2622

Community Programs and Women's Participation

The Chinese Experience

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Effectively implemented gender-focused interventions can have substantial social benefits when supported by the necessary legal and institutional framework, judging from this rural program in China.

The World Bank
East Asia and Pacific Region
Poverty Reduction and Economic Management Sector Unit
June 2001

POLICY RESEARCH WORKING PAPER 2622

Summary findings

Using household data specifically collected for the purpose of evaluation, Coady, Dai, and Wang empirically evaluate the impact on household income of a rural program in China that focuses on increasing women's economic and social participation in the local community. They find that the program substantially increases women's participation and household income, and also generates positive social benefits.

The authors' results also suggest that the income gains accrue only to participants, and partly at the expense of nonparticipants. They find that the magnitude of the program's impact depends sensitively on the program's ability to increase participation rates within villages.

In the presence of the program, individual participation helps to prevent negative externalities and to buy into the positive gains accruing to participants.

The authors' results support the view that effectively implemented gender-focused interventions can have substantial social benefits when supported by the necessary legal and institutional framework.

This paper—a product of the Poverty Reduction and Economic Management Sector Unit, East Asia and Pacific Region—is part of a larger effort in the region to better understand the impact of gender-focused policies on development. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Limin Wang, room MC5-208, telephone 202-473-7596, fax 202-522-1735, email address lwang1@worldbank.org. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. David Coady may be contacted at d.coady@cgiar.org. June 2001. (37 pages)

Community Programs and Women's Participation: The Chinese Experience

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JEL Classification: I38, J15, J70, O1

Keywords: Gender bias, women's participation, social capital, public policy, China

Acknowledgements: We would like to thank Jean Dreze, Athar Hussain, Jenny Lanjouw, Peter Lanjouw, Christopher Scott, Peter Sanfey, Jonathan Wadsworth and seminar participants in STICERD, London School of Economics and the International Food Policy Research Institute. The authors acknowledge research assistance from John Montgomery for compiling reference articles.

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Community Programs and Women's Participation: The Chinese Experience

1. Introduction

Globally, over the last few decades, women's economic and social well-being has improved substantially. However, gender inequality is still widespread, and particularly so within developing countries. Empirical evidence from a number of countries establishes the fact that women still have substantial disadvantages over men, both within households and in economic and social life (Haddad, Hoddinott and Alderman, 1997; Dreze and Sen, 1995; Filmer, King and Pritchett, 1998).

The persistence of female deprivation is generally attributed to a combination of social and cultural norms as well as being a result of various market failures. At the same time, a large body of empirical studies across many developing countries, in particular in Asia and Africa, consistently shows that improvements in women's education, health, employment opportunities and social participation, can generate substantial benefits. Investment in women not only benefits women themselves but also has relatively high social returns reflected in an improvement in their children's welfare and a reduction of fertility, poverty and gender bias (Summers, 1992; Subbarao *et al*, 1993; Quibria, 1993).[1] Therefore, gender-focused public policies are desirable not only from the perspective of social justice, but also because of the substantial social and economic benefits which result directly from enhancing women's social and economic status both within the household and in society as a whole. Also, the importance of market failures in determining outcomes suggests a potentially important role for public polices aimed at improving the welfare of women.

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[1] Summers (1992, p1) argues that "an extensive body of recent research conducted at the World Bank and elsewhere has convinced me that once its benefits are recognized, investments in girls' education may well be the highest return investment available in the developing world".

There is substantial evidence supporting the conclusions that Chinese women have achieved higher levels of well-being compared to their counterparts in other developing countries. A comparison of a range of development indicators illustrates this point strikingly. Based on statistics from the *World Development Indicators* published by the World Bank, female life expectancy at birth in 1992[2] was 71 for China, 59 for India, 59 for Pakistan and 62 for Indonesia. Female literacy rates in the same year were 68% for China, 39% for India, 22% for Pakistan and 77% for Indonesia. In 1992, the birth rate per thousand in China was 19, while India's birth rate was as high as 29 and the average figure for poor countries excluding China and India was 37. It is widely believed that, to large extent, much of this achievement in improving women's welfare can be attributed to the implementation and enforcement of a wide range of gender-focused public policies over the past few decades (Das Gupta *et al*, 2001).

All the above statistics illustrate China's success in empowering women and in combating deep-rooted feudal values, which would otherwise have largely excluded Chinese women both socially and economically. However, despite China's attractive record in this area, there exist surprisingly few empirical studies evaluating gender-focused public polices and programs. Recent work includes a case study by the All-China Woman's Federation (1993) and the World Bank study by Coletta and Sutton (1989), but none of these is based on rigorous empirical analysis of survey data. This may be due partly to the lack of attention paid inside China to collecting quantitative survey data on this topic.

Recently, however, several national surveys have been conducted in China focusing on assessing women's social and economic status. These include: (1) the 1991 Survey of Women's Status in Contemporary China, (2) the 1991 Survey of Female Science and Technology Employees, (3) the 1992 Survey of the Situation of Children, and (4) the 1993 Survey of Female

[2] We chose 1992 so as to coincide with the implementation of the Chinese rural community program under evaluation in this paper. Detailed discussion of the project is presented in Section 2 below.

Cardres. Research based on these national surveys has been published within China (Tao and Jian, 1993; Wang, 1993; China Statistical Bureau, 1993; and Yie, 1997). These surveys provide a rich data source for analyzing and assessing Chinese women's social and economic status as well as for identifying key determinants of women's well-being.

But these surveys are not specially designed for the purposes of program and policy evaluations. However, the 1996 household survey collected for the purpose of evaluating the so-called *Population Control and Community Development Project*, which has recently been made publicly available, is unique in this respect. The program, initiated by the Central Population Planning Committee[3], was implemented in villages across 34 county towns in rural China in 1993. In 1996, three years after program implementation, a household survey was conducted for 57 villages, with 38 treatment villages and 19 control villages. Detailed socio-economic information on women and households was collected in the survey, and the questionnaire was specifically designed to collect information on women's economic and social participation within villages.

The availability of such a survey provides us with an unique opportunity to formally evaluate the impact of gender-based public interventions in the Chinese context. To our knowledge, no rigorous program evaluation has been carried out using this data. Using this data, in this paper we attempt to evaluate the economic and social impact of the program on the rural communities. We address the following questions. First, can such a community program be transformed into human and social capital, which increases women's (or their family's) productivity, narrowly measured by their income-generating capacity? Second, does the program generate external benefits at the village level in the form of influencing the incomes of non-participants as well as participants? Thirdly, how important is the program's ability to increase the level of participation within villages for its ability to generate income impacts? Finally, are

there social benefits associated with such gender-focused programs, in particular, through impacts on children's welfare as well as on women's fertility decisions and gender preferences?

The structure of the paper is as follows. In Section 2 we provide both an overview of gender-focused public policy in China and details of the nature of the community program being evaluated. In Section 3 we discuss the survey data used in our analysis and the methodology used to analyse this data. Section 4 presents the results from our empirical analysis. Section 5 concludes.

2. Gender-Focused Public Policy and the Community Program

In this section we first provide an overview of gender-focused public policy in China and its role in improving the well-being of Chinese women. We then describe the specific community program to be analysed in this paper.

2.1 Gender-Focused Public Policy in China

As pointed out above, Chinese women have experienced a significant improvement in their well-being compared with women in many other low-income countries. This suggests that important policy insights may be gleaned from improving our understanding of the underlying factors that have contributed to higher women's welfare in China, a country ranked among the poorest countries in the world in the 1990s. To this end, a brief overview of China's history of gender-focused public polices is thus helpful.

The Chinese government has played an active role in implementing and enforcing gender-based public policies in key areas since as early as the 1950s. Specific public polices were designed particularly to : (1) improve women's education, health care, and employment

[3] One of the key organisations in the central government responsible for formulating population policies and their implementation nationwide.

opportunities, (2) promote women's social and political involvement at all levels of administration, and (3) establish a legal and institutional framework to protect woman's property rights and to promote equality in employment opportunities, access to basic services, and participation in political life. In principle at least, the implementation of public policies designed to promote women's well-being has been made mandatory nation wide with particular attention paid to rural and poor areas where women's deprivation was deeper and more widespread (Tao and Jian, 1997).[4]

One of the most significant achievements in of China since 1949 has been the widespread public provision of basic services in education and health care and its focus on equal access. Based on figures published by the Research Institute of All China Women's Federation (1991) between the early 1950s to late 1980s, the number of health clinics (focusing particularly on providing primary health care for women and children) increased from 349 to 2,793 in urban areas, and from 2,880 to 11,795 in rural areas. This clearly has contributed to the improvement of health outcomes for women and children. For example, female life expectancy at birth has increased from 35 years in the early 1960s to 71 in the early 1990s (The World Bank, 2000). The focus on investment in social infrastructure included setting up evening schools and the provision of literacy classes in local communities, and this has undoubtedly been one of the major factors explaining the rapid reduction of adult (particularly female) illiteracy rates. Chinese official statistics show that the female illiteracy rate fell from 64% in 1970 to 24% in 1998 (Research Institute of All China Women's Federation, 1998).

This overview of public policy in China reveals not only its gender focus but also the recognition of the complementarity between different sets of policies. It has been recognised that women's status can only be improved when a supporting legal and institutional framework is

[4] One expects, however, that the vigour with which these policies are implemented varies depending, for example, on the nature of the policy, on the region, and on the commitment of local leaders to the particular policy.

well established, an area where government intervention is particularly crucial. To this end, the land reforms in 1950 endorsed the equal entitlement of land between men and women. The marriage law, introduced in 1957 and further modified in 1985, was geared towards the protection of women's welfare both within and outside the family. In addition, various programs were implemented aimed at raising the awareness of women's legal rights and providing women with legal information and advice services (Wu and Cheng, 1997). School attendance both for boys and girls was made mandatory as early as the 1970s. This has had a profound impact on increasing female school enrolment and reducing intra-household gender bias, as reflected in the fact that female enrolment rates in primary and middle schools increased from 33% to 45% and 25% to 40%, respectively, between 1950 and the early 1990s.

The Chinese government has also emphasized women's participation in political life. According to statistics published by the Research Institute of All China Women's Federation (1998), the proportion of female parliament members was around 12% in the 1950s and rose to over 21% in the 1990s. Female political party membership has been as high as around 40% of total membership since the 1970s, and women accounted for over one third of political carders.[5] Another indicator, the proportion of female staff engaged in scientific research, which reflects both female educational achievement and gender equality, shows that women have accounted for over one third of the staff in this profession since the 1970s.

Clearly, China's success in improving women's status is undoubtedly associated with its long history of implementing gender-focused public polices and programs. Thus, there are likely to be important policy lessons to be learnt from the Chinese experience. Empirical research, in particular focusing on evaluating public programs, is extremely valuable in this regard. Unfortunately, empirical research in this area has been sparse, partly due to data limitations. However, even when data sources were available, the studies carried out (e.g. Peng and Dai,

[5] A *cadre* is a high-ranking political appointee.

1996 and Lin, 1997) tended to focus more on qualitative case studies with little attention paid to quantitatively evaluating the impact of existing public programs. In this paper, we aim to fill this gap. Using the 1996 household survey, we attempt to evaluate the economic and social impact of a specific gender -focused public program.

2.2 The Community Program

The *Population Control and Community Development Project* is a gender-focused community program. The key objectives of the program are: (i) to help women identify a range of potential economic and social opportunities, and (ii) to facilitate the development of public and community institutions to enable women to exploit these opportunities. In a sense, the program is an example of what Uphoff (1992, p273) refers to as a "top-down" intervention aimed at introducing, sustaining and institutionalizing "bottom-up" development.

This project was designed primarily to evaluate the impact on women's fertility decisions of public interventions aimed at enhancing women's economic and social opportunities. It is being recognised more widely in China, both among policy practitioners and within the research community focusing on assessing population policies, that family planning polices can be more effectively implemented and enforced through providing women with more social and economic opportunities than by simply deploying coercive measures aimed at controlling population growth. Leading sociologists and demographers in China have also become more aware of the potential impact of community development programs on social norms, e.g. regarding gender preference and desired family size (e.g. Peng and Dai, 1996). As a result, a team of population experts (including both policy practitioners from the Central Population Bureau and scholars from the Population Research Institute at Fudan University) initiated, designed and implemented this community program. The program was implemented in

1993 in over 37 *xian*[6] across 17 provinces (out of 28) in China. In all, 57 relatively poor villages across rural areas were chosen to evaluate the program, with 38 villages chosen as treatment villages where the program was implemented and the other 19 villages used as a control group (i.e. without intervention).[7] The data collected relate to the year 1996, three years after program implementation. Several qualitative case studies in a few villages have been carried out to assess the impact of this program (Dai and Peng, 1996; Lin, 1997) and the findings suggest a positive program impact in terms of reducing preferred family size, reducing gender bias, and increasing women's participation in community life.

The community program has both economic and social dimensions. The program involved agricultural seminars and extension services, organised cultural and entertainment activities (e.g. dancing groups, chess clubs and reading groups), and political meetings. One of the special features of this project is its emphasis on the development of human and social capital rather than providing financial aid. Therefore, direct financial support from central or local government is very limited. Village leaders in the treatment group were given seminars on the importance of community development, women's participation and their impact on women's fertility attitudes. Women were given priority access to agricultural extension services initiated and supported by local government, including information on new farming technology, and training and technical assistance. Agricultural technicians were invited to give advice on farming techniques mostly suitable for local conditions and on various productive activities to which woman are better suited. Based on the principle of self-sufficiency and self-development, financial resources for setting up village libraries, reading rooms or social and entertainment facilities come mainly from the taxation of village enterprises and/or reallocation of village general funds.

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[6] A *xian* is a collection of neighbouring villages.

[7] Program organisers claimed that the choice of villages participating in the program was made randomly, but we also test this in our analysis.

The experience of *Luochun,* one of the treatment villages, provides a specific example of the program (Dai and Peng, 1996). In 1993, *Luochun* had annual per capita income around 500 yuan ($75) and an average number of children per woman of 3.5. It had been traditionally underdeveloped and backward in many respects. Community social activities were particularly lacking and most women were confined to domestic life. Through the community development project, employment opportunities for women in areas such as apple processing, tobacco processing, and marketing of the local traditional handicrafts (e.g. embroidery) have been identified as effective ways of promoting women's economic participation. Also, as a result of the program, a reading room and an entertainment hall were built to improve women's social involvement in community life.

An important feature of the program is its emphasis on enhancing women's social as well as economic participation in the community. Improving women's access to income generating opportunities is obviously expected to result in higher incomes. However, a more recent body of literature also draws attention to the notion of social capital and its links with social participation. The concept of social capital, according to Putnam (1993), refers to features of social organisation and participation, such as trust, norms and networks.[8] Social capital formed through individual participation in social life, it is argued, shares the same features as physical and human capital which are productive in terms of income-generating activities. In addition, social capital has externalities in the sense that higher levels of social capital in local communities can benefit participants and non-participants alike.[9] According to Woolcock and

[8] See Woolcock and Narayan (2000) for a useful review of the literature from the perspective of economic development, including Narayan and Pritchett (1997), Knack (1997), Knack and Keefer (1995), Grootaert (1999), and Maluccio, Haddad and May (2000). See Coleman (1988) and Fukuyama (1995) for details of the extensive discussion of social capital in the sociology literature.

[9] There are many forms of social capital; here we are more concerned with the more *inclusive* community-level social capital than with the *exclusive* social connections considered by, for example, Olson (1982), Borjas (1994), Migdal (1987) and Case and Katz (1991).

Narayan (2000, p226), empirical evidence suggests a wide range of benefits from the accumulation of social capital:

> Those communities endowed with a diverse stock of social networks and civic associations are in a stronger position to confront poverty and vulnerability (Moser, 1996; Narayan, 1995), resolve disputes (Schafft, 1998; Varshney, 2000), and take advantage of new opportunities (Isham, 1999).....A defining feature of being poor, moreover, is that one is not a member of – or may even be actively excluded from – certain social networks and institutions that could be used to secure jobs and decent housing (Wilson, 1987, 1996)."

The authors thus also recognize (p231) that "imputing only desirable outcomes to social capital, or equating them with it, ignores the possibility that these outcomes may be attained at another group's expense".

The literature on social capital suggests that there are a number of ways through which social participation can be income enhancing. Firstly, voluntary co-operation is more likely to occur in a community where the stock of social capital is abundant leading to superior economic outcomes in comparison to those from non-cooperative behaviour. In particular, social capital can enhance greater co-operation and collective action in the provision of local public goods. Secondly, social capital reduces the cost of information, thus lowering transaction costs, increasing the volume of mutually beneficial trading, and facilitating the diffusion of modern technology. Thirdly, greater social capital can to some extent compensate for information imperfections that could form barriers to many economic activities taking place. For example, many economically beneficial investments may not take place if credit or insurance markets function badly due to imperfect information. Fourthly, social capital can compensate for the absence of formal legal and political institutions by encouraging economic activities in the absence of enforceable contracts, supporting the socially efficient management of natural resources, and promoting responsible citizenship.

The concept of social capital is broadened and enriched when it is discussed in the context of women's empowerment. If the formation of social capital is through women's

participation in society, then the evidence identified earlier suggests that substantial economic and social benefits can be generated. In this paper, we aim to empirically test this widely held view in the context of the Chinese experience.

3. Data and Methodology

In this section we present a brief discussion of the data used in the analysis. This is then followed by an explanation of the methodology used to evaluate the social and economic impact of the program.

3.1 Data

Although the survey and the community program were primarily designed to assess the impact of a woman's participation in community life on her fertility preferences, the information available from the survey is sufficiently extensive to allow us to address a somewhat broader set of issues related to women's economic and social participation. The survey collected detailed information in three areas: (1) household socio-economic data; (2) women's community participation activities; and (3) women's attitudes to gender and fertility issues. This information was collected for both control and treatment households in 1996; the absence of baseline data for 1993 obviously restricts the nature of our analysis (e.g. we are unable to control for unobserved individual fixed effects). Table 1a provides a statistical summary of the survey data for both sets of villages and Table 1b describes some of the variables in more detail and how they enter into our regression analysis.

A central objective of our analysis is to determine if the program has some features of capital (i.e. both economic and social), which increase income. To the extent that the control and treatment localities were randomly selected, a simple comparison of mean income across both groups can provide an unbiased estimate of the program impact on income. However, from

Table 1a we can see that many variables, which one would assume to be *exogenous* (i.e. not influenced by the program, at least within a three-year period) do in fact differ. For example, the mean levels of education, land size, age and number of laborers differ across the control and treatment villages. Also, the control households are disproportionately concentrated in the Northern region while the treatment households are disproportionately concentrated in the South-West region. These differences cause concerns regarding the randomness of program assignment to communities in practice. Below we discuss the methodology employed in the paper to evaluate the impact of the program and to deal with potential problems arising from endogenous program placement and/or self-selection issues relevant to program evaluation.[10]

3.2 Methodology

In line with the above discussion of the data and the implications for estimating program impact, we first compare mean income levels in control and treatment areas based on household-level data. To control for observed heterogeneity across households, we then estimate the program impact on income using multivariate ordinary least squares (OLS) regression techniques based on the following equation:

$$\log y_i = \alpha + \beta X_i + \delta \, Vpd_i + u_i$$

where y_i is annual household income and X_i includes socio-economic variables such as the age and education of both husband and wife, number of labourers, land size, and location (i.e. regional) dummies. The error terms u_i's are assumed to follow independently identical distributions. The variable *Vpd* is a dummy capturing (village) *program participation* – that is, takes the value unity for households in "treatment" villages and zero for those in "control" villages. However, *Vpd* cannot be treated as exogenous if, for example, the choice of program

[10] For detailed discussion on these issues see, for example, Heckman (1979, 1996, 1997), Heckman and Robb (1985), Rosenzweig and Wolpin (1986) and Pitt, Rosenzweig and Gibbons (1995).

placement is not random, e.g. if high-income villages are more likely to secure participation in the program or if officials selecting villages for participation in the program bias the selection in favour of poorer villages. To control for such possible endogenous selection of villages into the program, we therefore use an instrumental variables approach, replacing *Vpd* with its predicted value derived from a probit regression of *Vpd* on *X* plus additional identifying variables. This requires the identification of a valid instrument variable, i.e. one which is highly correlated with program selection but not correlated with income. We discuss the choice of instrumental variables in Section 4.

For our analysis of the interdependence between individual participation and the program in determining income, we add to the above equation the variable *Ipd*, an *individual participation* dummy based on whether the individual participates in a range of community activities associated with the program. Again, since there may be a two-way relationship between individual participation and income, we estimate this model using instrumental-variable techniques. We also interact the program dummy with *Ipd* to try to capture the distribution of program benefits across those households that participate in the community activities and those that don't.

However, the above model is restrictive in that it ignores the fact that individuals that are more likely to benefit from (i.e. have a comparative advantage in) participating in community activities are in turn more likely to be observed participating. To allow for such self-selection, we also estimate the following "switching regression" model (Maddala, 1983):

$$\log y_{1i} = \alpha_1 + \beta_1 X_{1i} + \gamma_1 \text{Vpd} + u_{1i} \qquad \text{(for participants)}$$

$$\log y_{2i} = \alpha_2 + \beta_2 X_{2i} + \gamma_2 \text{Vpd} + u_{2i} \qquad \text{(for non-participants)}$$

$$I^*_i = \theta Z_i + v_i \qquad \text{(participation decision)}$$

with I^* interpreted as a latent variable where we observe participation (i.e. *Ipd*=1) if $I^*>0$ and non-participation (i.e. *Ipd*=0) if $I^*<0$. Note that, in addition to the X variables, Z contains extra

variables thought to affect participation decisions, but not income. We estimate the income equations separately for participants and non-participants, controlling for endogenous selection using Heckman's two-stage estimation technique. Finally, in order to analyse how the program impact depends on its ability to increase participation rates within villages, we add an extra term to these equations, namely, the proportion of households participating within each village in which the household resides (*Vpdlevel*) and its interaction with the program dummy.

Finally, we capture the social benefits of the community program in terms of its effects on women's decisions on children's education expenditures, fertility decisions, and gender attitudes. These variables are admittedly rather narrow and only partially capture the notion of social benefits, but this limitation is mainly due to data availability in the survey. We assess the social benefits of the program based on three separate reduced form equations: (1) expenditure on children's education, (2) gender preference indicators; and (3) fertility preferences. The estimated coefficients of the program dummy variable in these equations should capture their social benefits. As above, we also address the problem of possible non-randomness of program placement.

4. Empirical Results

In this section we present the results from our empirical analysis in the following three areas. First, we analyse the impact of the program on household incomes and test for evidence of program placement bias. Second, we assess the program's impact on participation levels as well as the relationship between the programs ability to increase incomes and its ability to increase participation. This is an important empirical issue as the key objective of the program is not only to increase the effectiveness of existing participation in generating income but also to bring about an increase in participation rates within villages. Thirdly, we test whether the program also

generates social externalities, i.e. the program impact on the welfare of children and reduction of fertility and gender bias?

4.1 The Program's Impact on Household Incomes

In so far as the control and treatment localities were randomly selected, a simple comparison of mean incomes provides an unbiased estimate of the program impact on income. Table 1a presents such a comparison and Table 1b summarises the definitions of variables used in the following analysis. Focusing on the total household income, the comparison across control and treatment villages indicates that the program increases total household income by nearly 27%, suggestive of a high economic return to the program. However, any deviations from random selection will mean that this is a biased estimate if both sets of villages differed systematically in terms of income-generating characteristics (e.g. landholdings, labourers, or access to income-earning opportunities outside of agriculture) prior to the program. Since the program is expected to generate benefits, it is possible that villages with higher average incomes or with more political influence tend to be better informed and have stronger bargaining power in securing such programs. Alternatively, officials may bias selection for program participation in favour of poorer villages.

Either way, neglecting the issue of endogenous program placement can have the consequence that interpretations of any empirical results can be misleading as to causal impacts. Therefore, testing for the endogeneity of village selection is an important part of our empirical investigation of the underlying direction of causality. Using OLS multivariate analysis, where we include a range of explanatory variables that could capture such systematic differences across control and treatment households, we can control for observed heterogeneity across households.[11] However, we also need to allow for the possible selection of villages based on unobservable

[11] Of course, in the absence of baseline data for 1993 we are unable to control for unobserved differences.

characteristics, which affect the choice of program placement. We address the issue of a possible simultaneous determination of income and village participation using the instrumental variables (IV) technique.

Table 2 presents the results from our analysis of the program's impact on household incomes using OLS and IV estimation methods. To implement IV estimation we need instruments that do not affect income directly but which affect participation in the program. As an instrument we choose the proportion of women interviewed in each village that are classified as party carders (i.e. high-ranking political appointees).[12]

Columns 1 and 2 in Table 2 summarize the key results of the income impact of the program. Our OLS estimate (column 1) of the income impact of the program shows that the presence of the program increases income by 19.4%. But if village income and program participation have an influence on each other, then our OLS estimate of the program effect is in general biased. Using IV estimation we can get a consistent estimate of the direct impact of the program on village income. Our IV estimation (column 2) produces a larger estimate of the impact of program participation: village participation in the program appears to lead to a 28% increase in income consistent with a strong causal link from the program to income.[13]

4.2 The Importance of Individual Participation

An important objective of the program is to increase both the level and effectiveness of women's participation in the economic and social life of their community. In this section we analyse the interaction between individual participation, the program and household income. We proceed in two steps. First, we test whether there is a causal relationship between individual

[12] We found that the instrument was statistically insignificant when included in the income equation, with a coefficient of –0.22 and a t-statistic of 1.03 (column 3, Table 2), yet highly significant when used to explain program placement, with a coefficient of 26.4 and a t-statistic of 35.7 (column 4, Table 2). We also tried to identify a number of other possible instruments but without success.

participation and income, and whether the program impacts differently on participants and non-participants. Secondly, we analyse the extent to which the program's impact on incomes depends on its ability to increase village-level participation rates.

The Role of Individual Participation

Table 3 presents the results of our analysis of how the program affects participation rates as well as how the income impact of the program differs across participants and non-participants. Column 1 presents the probit regression with the individual participation dummy as the dependent variable. The estimated coefficient on the treatment dummy indicates that the program has a large positive and highly significant impact the probability of participation, increasing it by nearly 25% (i.e. the marginal effected based on the coefficient of 0.64). Other household characteristics that were found to influence women's participation decisions were her education (positively), family size (negatively), and having a family heir (negatively).

What is the relationship between individual participation and income? How is this relationship influenced by the presence of the program? We address the first issue by introducing the individual participation dummy into the OLS income regression. Interacting individual participation with the program treatment dummy enables us to test whether the program impacts differ across participants and non-participants. Our results using OLS estimation (column 2) indicate that: (1) individual participation is positively associated with income, (2) the relationship between individual participation and income depends on whether one resides in a treatment or control village, being higher in the former (at 17.6%) than in the latter (at 6.4%), and (3) the impact of the program on income also differs according to whether one participates or not, being larger for the former (at 22%) then for the latter (at 10.8%).

The above results indicate that individual participation is positively correlated with household income, and that the correlation differs across treatment and control villages. What

[13] It is interesting to note that our IV estimate is virtually identical to our estimate of 27% using a simple

about the direction of causation between the income and individual participation? We address this issue by instrumenting individual (as well as program) participation (column 3). We instrument individual participation using information in the survey on whether or not the household already has a "boy heir" and whether the woman is a cadre, both being regarded as correlated with participation decision but not with household income. Both these variables were insignificant when included in the income equation (column 4) yet highly significant in determining individual participation (column 1), with the probability of individual participation being lower for a woman with a boy heir and higher if she is a cadre. The IV estimates (column 3) suggest a somewhat different pattern of influences: the impact of individual participation on income is still higher for those living in treatment villages (at 13%) but is now negative for those living in control villages (at 273%). Similarly, the effect of program treatment is positive for participants (at 169%) and negative for non-participants (at –114%).

Although the sign pattern of our IV estimates of program impact is plausible, the same cannot be said of the magnitudes. This could be due to model mis-specification, i.e. not taking account of self-selection by individuals. We use the Heckman two-step estimation procedure, which allows for self-selection, to deal with the model mis-specification issue. The results, reported in columns 5 and 6, show that both the sign and the magnitudes of the program effects seem more plausible than that from the OLS. Our estimates suggest that the program increases the income of participants by 62% but decreases non-participants income by around 20% (but this latter effect is only significant at the 10% level). This finding indicates that the program may generate some form of negative externalities for non-participants. In other words, in the presence of the program, the benefit to participants comes partly at the expense of non-participants. If this is indeed the case, it raises the important question of how to design such programs so as to avoid such adverse effects.

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comparison of unconditional mean incomes across control and treatment villages in Table 1a.

The Role of Village-Level Participation Rates

The above empirical evidence shows that (1) the program affects both participants and non-participants very differently and (2) the program is also extremely effective at increasing participation rates within villages. This raises the issues of the importance of the ability of the program to increase participation rates for its ability to increase incomes. To examine this issue, in the income equation we add a variable reflecting village-level individual participation rates, i.e. the proportion of women classified as participants in each village (*Vpdlevel*). This variable is interacted with the program treatment dummy, but does not enter separately since we wish to estimate the effect of the program inclusive of the effect due to increasing participation rates. This specification allows the impact of the program on participants and non-participants to depend on the level of participation in the village. The top part of the Table 4 presents the estimation results. We estimate an income equation separately for participants and non-participants using the Heckman two-step estimator to allow for endogenous selection in individual participation.

The bottom panel of Table 4 presents the program impact on participants and non-participants for different participation rates within villages: the estimated coefficients presented in the top panel are used to simulate the program impact at different levels of participation. The range of participation rates is chosen to reflect those observed in the sample: the participation rates of 45% and 65% are the means for the control and treatment samples, respectively, and 55% is taken as an intermediate rate. Loosely speaking, we can interpret 45% as the pre-treatment rate and 65% as the post-treatment rate.[14] Focusing on participants, our results suggest that the magnitude of the program impact depends sensitively and positively on the ability of the program to increase participation rates. If the participation rate was to stay at its pre-treatment

[14] This is consistent with our results in Table 3, column 1.

level (i.e. 45%) then incomes would only increase by 3.1%: we can loosely interpret this as arising from the program's impact in increasing the effectiveness of existing participation. However, if the program increases the participation rate then its income impact will also increase substantially, with each 10% point increase in participation rates associated approximately with a 20% increase in income. This pattern suggests that most of the income gains generated by the program can be attributed to the level effect on participation rates.

Focusing on non-participants, the first thing one notices is that the program still has negative effects. Although these effects are not statistically significant, their pattern is interesting, with the negative impact on non-beneficiaries increasing with participation rates. At the low pre-treatment participation levels, non-participants experience a 5.5% decrease in income, again suggesting that some of the increased income gains for participants come at their expense. This negative spillover effect on non-participants is larger the more successful the program is at increasing participation rates. A non-participant residing in a village where the participation rate is increased to 65% experiences an income loss of 16.6%.

To summarize, the ability of the program to impact on household incomes appears to depend sensitively on its success in increasing participation rates: both the positive impact on participants' incomes and the negative impact on non-participants' incomes are stronger the more successful the program is at increasing participation rates. In this sense, it appears that, in the presence of the program, participation helps to protect one from negative spillover effects and to buy into the income gains accruing to the village.

4.3 The Social Benefits of Women's Participation

Recent empirical evidence from many countries has repeatedly shown that gender-focused public policy generates substantial social externalities, including improvement of child welfare (e.g. health, nutrition and education attainment) and reduction of gender bias and fertility

rates. In this section we analyse some channels through which these benefits may emerge from the program. However, quantifying the full extent of such social benefits is a formidable task as the information required is difficult to obtain and measure accurately.

In our own analysis, we are faced with two principle difficulties. First, the spell between the program implementation and the survey (three years from 1993 to 1996) is too short to observe any significant change occurring within households for the types of indicators in which we are interested in (e.g. fertility outcomes). Secondly, information directly related to the issues at hand is limited to measures of expenditure on children's education and attitudes towards fertility and gender issues. The potential problem with most of the attitudinal questions is subjectivity, reflecting expressed views rather than revealed preference through actions. However, given the short spell between the program implementation and the survey, it is changes in attitudes rather than any other indicators (such as lower gender discrimination in labor markets or lower fertility rates) for which we would expect the program and participation to have a significant impact. Therefore, the analysis of attitudinal information may shed some light on the potential effectiveness of such gender-based public programs, particularly from the perspective of factors that affect family preferences (i.e. the demand side).[15]

Table 5 presents the results of our analysis of the program's impact on educational expenditures on children, as well as on gender and fertility preferences. Since in all cases the OLS and IV estimates were very similar, we present only the latter. We first examine the determinants of expenditures on children's education, including school fees and expenditure on textbooks. The regression analysis shows that the program increases these expenditures by nearly 110 yuan, equivalent to nearly a 17% increase from the mean level of 671 yuan observed in control villages (Table 1a). However, although the impact is large, it is statistically insignificant.

[15] It is commonly argued, for example, that family planning programs that focus solely on the supply side (i.e. providing information on and access to family planning technologies) are ineffective in the absence of a demand for such services.

Secondly, we explore factors that affect gender and fertility attitudes. Regarding the gender question, women in the survey were asked: (i) Is it essential, given social attitudes, for a household to have a male child, and (ii) Given the present (i.e. more modern) farming technology, are male labourers still perceived as more important than their female counterparts? Turning to gender question (i), which we interpret as mainly reflecting cultural values or social norms, the probit estimation (column 2) indicates that the program has a substantial impact in reducing the probability of preferring boys to girls (the probability of such a gender bias decreases by 24 percentage points as a result of the program). Our estimation on gender question (ii) presented in column 3, i.e. whether there is a premium attached to male labourers given the existing production technology, shows that the program exerts a significant impact on the probability of valuing male over female labour (reducing it by 23 percentage points).

The community program and the survey was conducted with a focus on evaluating the impact of gender-based public policy on women's fertility attitudes, so our empirical finding on this issue is of particular interest. Our analysis focuses on the answers to the following question: If family planning policies were to permit, would you want extra children? Our results indicate that the program has a beneficial impact in terms of reducing the desire for larger families, resulting in a 7 percentage points decrease in the probability of wanting a larger family (column 4). As expected, having a boy heir decreases this probability further by 5 percentage points.

The above results taken together suggest that the program has substantial social externalities in terms of expenditures on child education (i.e. increasing demand for child quality), decreasing the demand for the quantity of children, and correcting gender biases that are in favor of male children. Thus, when combined with the income effects identified earlier, our analysis provides empirical evidence to support the claim that the gender-focused programs that emphasise promoting women participation in both economic and social community activities can generate significant benefits.

5. Summary

In this paper, we empirically analyse the impact of a public program that focuses on empowering rural Chinese women by increasing their level of economic and social participation as well as its effectiveness. We find support for the view that such programs can substantially increase the household incomes of participants but that some of this comes at the expense of negative income externalities for non-participant households. Our results also suggest that the program is extremely successful at increasing participation rates within villages and that the program's income impacts depend sensitively on the ability to achieve such increases. The more successful the program is at increasing participation rates the greater both the positive impact on participants' incomes and negative impact on non-participants' incomes, with the former substantially greater than the latter. In this sense, in the presence of the program, the gains from participation come from protecting oneself from these negative effects and from buying into the substantial income gains accruing from increased participation rates. We also analyse a range of channels through which social benefits could emerge from the implementation of the community program. Our results indicate that the program has a significant positive influence on gender and fertility attitudes as well as on children's welfare though increasing education expenditures.

In conclusion, then, our results support the view that public policies geared towards increasing women's economic and social participation can generate substantial economic and social returns. However, the finding that the program has negative income externalities for those who do not participate suggests that it is important to consider how such programs may be designed to avoid such adverse effects. Our results also lend support to the view that the range of gender-focused public policies implemented over the last few decades provides a complementary background, which contributes to the success of effectively implemented gender-focused programs. It is thus likely that further research aimed at improving our understanding of

Chinese experiences can provide important lessons for the design of effective public policy in this area.

References

All-China Women's Federation (1993): *The Impact of Economic Development on Rural Woman in China*. A Report of the United University Household Gender's Age Project.

Borjas, G. J (1995): "Ethnicity, Neighbourhoods, and Human-Capital Externality", *American Economic Review*, Vol 85, No. 3, pp365-390.

China Statistical Bureau (1993): *1992 National sample Survey on the Situation of Children: National Final Report*, China Women Publishing House: Beijing.

Coleman, J. (1988): "Social Capital in the Creation of Human Capital", *American Journal of Sociology*, 94(Supplement), S95-120.

Coletta, N., and M. Sutton (1989): "Achieving and Sustaining Universal Primary Education: International Experience Relevant to India". *Policy, Research and External Affairs Working Paper 166*, World Bank, Population and Human Resource Dept, Washington DC.

Das Gupta, M., S. Lee, P. Wang, L. Wang, and X. Zhang (2001): "State Policies and Women's Autonomy in China, India and the Republic of Korea 1950-2000: Lessons from Contrasting Experiences", *Working Paper*, No. 2429, Poverty and Human Resources, World Bank: Washington DC.

Dr◄xze, J and A. Sen (1995): *India Economic Development and Social Opportunity*. Oxford University Press.

Filmer, D., E. King and L. Pritchett (1998): "Gender Disparity in South Asia: Comparisons Between and Within Countries", *Working Paper*, No. 1867, Poverty and Human Resources, World Bank: Washington DC.

Fukuyama, F. (1995): *Trust: The Social Virtues and the Creation of Prosperity*. New York: Free Press.

Grootaert, C. (1999): "Social Capital, Household Welfare, and Poverty in Indonesia", Local Level Institutions *Working Paper 6*, World Bank, Social Development Department, Washington DC.

Guan, T. (ed) (1993): *Analysis of the Social Status of Women in China*, Vol. 1. China Women Publishing House: Beijing.

Haddad, L., J. Hoddinott and H. Alderman (eds.) (1997): *Intrahousehold Resource Allocation in Developing Countries: Methods, Models and Policy*. Baltimore: JHUP.

Heckman, J. (1979): "Sample Selection Bias as a Specification Error", *Econometrica*, 47, pp153-161.

Heckman, J. (1996): "Randomization as an Instrumental Variable", *Review of Economics and Statistics*, 77(2), pp. 336-41.

Heckman, J. (1997): "Instrumental Variables: A Study of Implicit Behavioural Assumptions Used In Making Program Evaluations", *Journal of Econometrics*, 32(3), pp441-62.

Heckman, J., and R. Robb (1985): "Alternative Methods of Evaluating the Impact of Interventions: An Overview", *Journal of Econometrics*, 30, pp239-67.

Hoddinott, J. (1996), "The Impact of Health Infrastructure on Child Health: Evidence From a Panel Study of Zimbabwean Households", *Discussion Paper*, University of Oxford.

Isham, J. (1999): "The Effect of Social Capital On Technology Adoption: Evidence From Rural Tanzania", paper presented at the annual meeting of the American Economic Association, New York.

Kalanidhi, S., and L. Raney (1993): "Social Gains from Female Education: A Cross-National Study", *World Bank Discussion Paper,* No. 194, Washington DC.

Lin, Z. (1997): "Rural Community Development and Women Participation in Villages In Mid-North Areas", in ChungFang Tao and Y. Jiang, eds., *Compendium of China Women's Studies: 1991-1995*, China Women Publishing House.

Subbarao, K., L. Raney, H. Dundar and J. Haworth (1993): "Women in Higher Education: Progress, Constraints and Promising Initiatives", Discussion Paper 244, World Bank: Washington DC.

Knack, S. (1997): "Does Social Capital Have An Economic Payoff: A Cross-Country Investigation", *Quarterly Journal of Economics*, 112, pp1251-88.

Knack, S., and P. Keefer (1995): "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures", *Economics and Politics*, 7(3), pp207-27.

Maddala, G. (1983): *Limited Dependent and Qualitative Variables In Econometrics*. New York: Cambridge University Press.

Maluccio, J., L. Haddad, and J. May (2000): "Social Capital and Household Welfare in South Africa 1993-1998," *Journal of Development Studies*, 36(6) pp. 54-81.

Migdal, J. (1987): "Strong States, Weak States: Power and Accommodation", in M. Weiner and S. Hantington (eds.), *Understanding Political Development*, Boston: Little, Brown.

Moser, C. (1996): *Confronting Crisis: A Comparative Study of Household Responses to Poverty and Vulnerability in Four Poor Urban Communities*, Environmentally Sustainable Development Studies and Monographs Series 8, Washington DC: World Bank.

Narayan, D. (1995): "Designing Community-Based Development", *Social Development Paper 7*, Environmentally and Socially Sustainable Development Network, World Bank: Washington, DC.

Narayan, D., and L. Pritchett (1999): "Cents and Sociability: Household Income and Social Capital in Rural Tanzania", *Economic Development and Cultural Change*, 47(4), pp871-97.

Olson, M. (1982): *The Rise and Decline of States: Economic Growth, Stagnation, and Social Rigidity*. New Haven: Yale University Press.

Peng, X., and X. Dai (eds.) (1992): *Challenges and Transform: Population Problems in Rural China during the Economic Reforms*. Fudan University Press.

Peng, X. and X. Dai (eds.) (1996): *Community Development and Fertility in Rural China*, Fudan University Press.

Pitt, M., M. Rosenzweig and D. Gibbons (1995): "The Determinants and Consequences of the Placement of Government Programs in Indonesia", in D. van de Walle and K. Nead, eds., *Public Spending and the Poor: Theory and Evidence*, Baltimore: JHUP.

Putman, R. D with R. Leonardi and R. Nanetti (1993): *Making Democracy Work: Civic Tradition in Modern Italy*, Princeton, N.J.: Princeton University Press.

Quibria, M.G (ed.) (1993): *Rural Poverty in Asia: Priority Issues and Policy Options*. Oxford University Press.

Rosenzweig, M., and K. Wolpin (1986): "Evaluating the Effects of Optimally Distributed Public Programs: Child Health and Family Planning Interventions", *American Economic Review*, 76(3), pp470-82.

Research Institute of All China Women's Federation (1991): *Statistics on Chinese Women: 1949-1989*, China Statistical Publishing House.

Research Institute of All China Women's Federation (1998): *Gender Statistics in China: 1990-1995*, China Statistical Publishing House.

Saito, K., and D. Sprurling (1992): "Developing Agricultural Extension for Women Farmers", *World Bank Discussion Paper.*

Schaff, K. (1998): "Grassroots Development and the Reconfiguration of Local Political Institutions: Local Minority Self-Governance as a Political and Economic Resource for Hungary's Roma Population", paper presented at the Graduate Student Conference on International Affairs, George Washington University, Washington DC.

Sen, A. (1985): *Commodities and Capabilities*. Amsterdam: North-Holland.

Summers, L. (1992): "Investing in All the People: Educating Women in Developing Countries", *Word Bank Working Paper*, World Bank, Washington DC.

Tao, C., and Y. Jiang (eds.) (1997): *Compendium of China Women Studies: 1991-1995*, China Women Publishing House.

Tao, C., and Y. Jiang (eds.) (1993): *Overview of China Women's Social Position*, China Women Publishing House.

Uphoff, N. (1992): *Learning From Gal Oya: Possibilities for Participatory Development and Post-Newtonian Social Science*. Ithaca, NY: Cornell University Press.

Varshney, A. (2000): *Ethnic Conflict and Civic Life: Hindus and Muslims in India.* New Haven, Conn.: Yale University Press.

Wang, X. (1993): "The Role and Promotion of Female Science and Technology Employees in China: An Survey Analysis", in ChunFang Tao, and Y Jiang, (eds.), 1997, *Compendium of China Women Studies: 1991-1995*, China Women Publishing House.

Wilson, W. (1987): *The Truly Disadvantaged.* Chicago, Ill.: University of Chicago Press.

Wilson, W. (1996): *When Work Disappears: The World of the New Urban Poor.* New York: Knopf.

Woolcock, M., and D. Narayan (2000): "Social Capital: Implications for Development Theory, Research and Policy", *World Bank Research Observer*, 15(2), pp225-49.

World Bank (1995): *Development in Practice Towards Gender Equality: The Role of Public Policy.* Washington, DC.

World Bank (2000), http://www.worldbank.org/resources/

Wu, C., and M. Cheng (1997): "Review of Women Laws", in ChunFang Tao, and Y P JIANG, (eds.), (1997), *Compendium of China Women Studies: 1991-1995*, China Women Publishing House.

Yie, Z. (1997): "Growth and Development of Female Cardres in China: An Survey Analysis", in C. Tao, and Y. Jiang (eds.) (1997), *Compendium of China Women Studies: 1991-1995*, China Women Publishing House.

Table 1a. Data Summary

	Treatment Villages	Control Villages	
Total Village=57	38	19	
Sample size=6628 households	4719	1909	
Household information (means)			**t-test[3]**
Female education	6.48	6.66	1.68
Male education	7.42	7.71	2.80
No. Labour	2.22	2.14	4.35
Land size	6.20	6.85	2.72
Female Age	32.9	32.1	4.21
Male age	34.4	33.9	2.56
Family size	4.04	3.88	5.62
Main Occupation			
Male: Farming	75.6%	78.0%	2.09
Animal Husbandry	2.4%	0.8%	4.11
TVE	2.4%	2.2%	0.42
Other	19.7%	19.0%	0.65
Female: Farming	81.6%	83.9%	2.22
Animal husbandry	7.9%	7.0%	1.20
TVE	1.8%	0.3%	4.71
Others	8.7%	8.8%	0.06
Net annual income (median)	7962 (6000)	6285 (5000)	8.36
Per-capita income (median)	2049 (1500)	1659 (1250)	7.62
House quality (Brick structure)	71.6%	63.7%	6.31
Self ranking housing quality[1] (top and above-average)	30.3%	16.1%	11.94
TV possession	45.4%	36.3%	6.73
Meat consumption level[2] (often)	71.7%	64.0%	6.15
Book expenditure (median)	85.0 (50)	66.9 (31)	5.44
Child education expenditure (median)	856.6 (500)	671.6 (400)	4.83
Information on Women			**z-test[4]**
Participating community activities	62.9%	44.4%	13.82
Village cardre	5.8%	2.9%	4.90
Village active member	14.6%	7.0%	8.58
Political member	9.1%	9.0%	0.13
Participating cultural activity	45.1%	19.2%	19.73
Location			
Northern region	42.7%	58.2%	11.46
South-West region	45.5%	30.9%	10.92
South-East region	11.8%	10.9%	1.07

Gender/Fertility Attitudes			
Gender bias (boys>girls)	32.6%	47.4%	11.32
Gender bias (male labor>female labor)	30.8%	44.1%	10.34
Desire more birth if allowed	27.9%	44.3%	12.88
Have boy heir	50.1%	50.8%	0.51
Village Facilities (satisfactory access)			
Road	64.4%	53.7%	8.08
Water system	61.6%	53.1%	6.38
School	86.8%	65.0%	20.31
Irrigation	69.3%	57.3%	9.24
Telephone facility	46.7%	31.8%	11.05
Clean public environment	62.2%	43.6%	13.87

Note: (1) Women were asked to rank the quality of their houses relative to others in the village across five choices: top, above average, average, below average and poor quality. (2) This is measured by how often a household consumes meat: everyday, often and rarely. (3) t-test is for testing the equality of means from two sets of villages, H_0: $\mu_t - \mu_{nt}=0$, where μ_t and μ_{nt} refer to population means of testing or non-testing villages. (4) z-test is for equality of proportions (for the response of being satisfied only).

Table 1b. Variable Definitions and Explanations

Variable Name	Definition	Explanation
Wife education	Measured by number of years of formal schooling	Enters regressions as series of dummies (as does her age).
Husband education	Same as above	Same as above
Family size	Total number of people working and living in the same household	Enters in log form in regressions.
Number labourers	Number of working adults	Enters with a level and squared term in regressions.
Land size	Total household land holdings	Same as above.
Income	Annual income	Net of grain used for own consumption and inputs
Vpd	Dummy signifying village participating in the program	There are 37 villages in the program with 20 villages used as control villages
Ipd	Dummy signifying individual participating in community activities	Community activities include political meetings, cultural and entertainment activities (dancing groups, chess groups and sports groups), agriculture seminars.
Vpdlevel (%)	Village-level participation	The proportion of interviewees in each village who participate
Village Facilities	Dummies signifying whether answered that had satisfactory access various facilities in village	Facilities included were road, water system, irrigation, telephone, school, and clean public environment
Occupation	Dummy signifying main occupation of husband and wife	Occupations include farming, animal husbandry, township and village enterprise (TVE), and "other".
Region Dummy	Dummy signifying region where household's village located: one of North, Southwest and Southeast regions	***North*** includes Liaoning, Jilin, Heilongjang, Beijing, Shanxi and Hebei provinces; ***Southwest*** includes Sichuan, Hunan, Yunnan, Henan, Hubei and Shangdong provinces; ***Southeast*** covers Fujian, Jiangsu and Zhejiang provinces.

Table 2. Program Impact On Household Income

	Col-1	*Col-2*	*Col-3*	*Col-4*
Dependent Variable	Log(income)	Log(income)	Log(income)	Vpd
Estimation Method	OLS	IV	OLS	Probit
Explanatory variables				
Treatment Dummy (Vpd)	0.194*	0.284*	0.202*	-
Village active members %	-	*	-0.216*	26.4*
Age Dummies	*	*	*	*
Education Dummies	*	*	*	*
Regional Dummies	*	*	*	*
Other Variables	*	*	*	*
R^2	0.22	0.21	0.22	0.23
N	6628	6628	6628	6628

Note: * denotes estimates are statistically different from zero at 1% level. Age and educational dummies are for both wife and husband. Other variables include family size, number of labourers, and land size.

Table 3. Introducing Individual Participation

	Col-1	*Col-2*	*Col-3*	*Col-4*	*Col-5*	*Col-6*
Dependent variable	Ipd	Log (y)	Log(y)	Log(y)	Log(y)	Log(y)
Estimation method	Probit	OLS	OLS	IV	Heckman	Heckman
Sample	Full	Full	Full	Full	Participants	Non-participants
Explanatory variables						
Program Dummy (Vpd)	0.638*	0.108*	-1.140*	0.172*	0.625*	-0.202***
Individual Participation (Ipd)	-	0.064**	-2.729*	0.143*	-	-
Interaction (Vpd*Ipd)	-	0.112*	2.863*	-	-	-
Boy Heir Dummy	-0.067**	-	-	0.010	-	-
Individual Cadre Dummy	0.242*	-	-	-0.002	-	-
Village proportion of active members (%)	-	-	-	-0.223	-	-
Age Dummies	***	*	*	*	*	*
Education Dummies	*	*	*	*	*	*
Regional Dummies	*	*	*	*	*	*
Other Variables	*	*	*	*	*	*
Inverse Mills Ratio	-	-	-	-	***	insig.
R^2	0.04	0.225	0.219	0.225	-	-
N	6628	6628	6628	6628	2813	3815

Note: *, ** and *** denote estimates are statistically different from zero at 1% , 5% and 10% levels. Age and educational dummies are for both wife and husband. Other variables include family size, number of labourers, and land size.

Table 4. Externality Effect Through Village-Level Participation Rate

	Participants	*Non-Participants*
Regression Results		
Program Dummy (Vpd)	-0.818*	0.194
Interaction (Vpd*Vpdlevel)	1.886*	-0.554
Age Dummies	*	*
Education Dummies	*	*
Regional Dummies	*	*
Other variables	*	*
Inverse Mills' Ratio	*	***
Program Impact Evaluated at:		
Vpdlevel=0.45	0.031	-0.055
Vpdlevel=0.55	0.219	-0.111
Vpdlevel=0.65	0.408	-0.166

Note: *, ** and *** denote estimates are statistically different from zero at 1% , 5% and 10% levels. Age and educational dummies are for both wife and husband. Other variables include family size, number of labourers, and land size.

Table 5. Program Social Externalities

	Col-1	*Col-2*	*Col-3*	*Col-4*
Dependent variable	Education expenditure Log(Edu.exp)	Gender preference (Boy > Girl)	Gender preference (Male labour > Female labour)	Desire more Children (yes=1, no=0)
Estimation method	IV	Probit	Probit	Probit
Explanatory variables				
Program Dummy	107.8	-0.24*	-0.23*	-0.07*
Age Dummies	*	**	**	*
Education Dummies	*	*	*	Insignificant
Regional Dummies	*	*	*	*
Other Variables	*	*	*	*
Has Boy Heir dummy	-	-	-	-0.05*
R^2	0.08	0.07	0.03	0.06
N	6628	6628	6628	6628

Note: *, ** and *** denote estimates are statistically different from zero at 1% , 5% and 10% levels. The coefficients in the final three columns are the marginal effects based on the probit regression coefficients. Age and educational dummies are for both wife and husband. Other variables include family size, number of labourers, and land size (and a dummy for having a boy heir in last column).

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